

Logarithms and Exponents

Logarithms are the "opposite" of exponentials, just as subtraction is the opposite of addition and division is the opposite of multiplication. Logs "undo" exponentials. Technically speaking, logs are the inverses of exponentials.

$$\log_b(x) = y$$

$x = b^y$ is equivalent to $\log_b x = y$
exponential *logarithmic*
 $4 = 2^2$ $\log_2 4 = 2$
 b=base and is always positive and
 not equal to 1
 y=power or exponent

Convert " $6^3 = 216$ " to the equivalent logarithmic expression.

$$\begin{aligned}
 b &= 6 \\
 x &= 216 \\
 y &= 3
 \end{aligned}$$

$$\log_b x = y$$

Convert " $\log_4(1024) = 5$ " to the equivalent exponential expression.

$$\begin{aligned}b &= 4 \\y &= 5 \\x &= 1024\end{aligned}$$

$$4^5 = 1024$$